

### Summary

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The present invention relates to a method for the manufacture of a high temperature-superconducting layer on a substrate (1a, 1b) comprising the steps of depositing an  $\text{RBa}_2\text{Cu}_3\text{O}_7$ -layer (2) with a low growth rate, wherein R represents yttrium, an element of the group of rare-earth elements (atomic number 57 to 71) or mixtures of two or more of these elements, and the deposition of an  $\text{XBa}_2\text{Cu}_3\text{O}_7$ -layer (3) onto the  $\text{RBa}_2\text{Cu}_3\text{O}_7$ -layer (2) with high growth rate, wherein X represents yttrium, an element of the group of rare-earth elements (atomic number 57 – 71) or mixtures of two or more of these elements. Preferably, the low growth rate is  $< 1 \text{ nm/s}$  and the high growth rate is  $> 1 \text{ nm/s}$ , preferably  $> 2 \text{ nm/s}$  and the  $\text{RBa}_2\text{Cu}_3\text{O}_7$ -layer (2) is preferably deposited onto an at least biaxially textured substrate (1a) or a substrate with an at least biaxially textured buffer layer (1b).

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(Fig. 1)